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Figure 4 A, B, C, and D are views and a cross section of the present invention;

Figure 5 A, B, and C are views of another embodiment of the present invention;

Figure 6 B and F are views of another embodiment of the present invention, Figure 6 H is a view of the hose;

Figure 7 B and F are views of a flange;

Figure 8 is a cross sectional view of the present invention;

Figure 9 is a cross sectional view of the present invention;

Figure 10 is a front view of the bearing support;

Figures 11 is a view of another embodiment of the present invention, Figure 11 E is a view of the extended shaft;

Figure 12 [F, B, S] X, Y, Z and A, B, C are views of another embodiment of the present invention ;

Figure 13 is a view of an attachable handle;

Figure 14 A and B are views of other embodiments of the present invention;

Figure 15 is a detailed view of Figure 14 A;

Figure 16 is a schematic of the power train;

Figure 17 is a view of the clutch arrangement; and

Figure 18 is a view of a view of the flexible shaft sleeve.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawing, there is illustrated in Figures 1A through 1E an embodiment of an arrangement fabricated according to the teaching of the present invention and generally designated 10. Figure 1A illustrates a rotary tool support generally designated 301 mountable within a hand piece generally designated 401. The hand piece 401 is fabricated to form a guard around a selected portion of the cutting surface 302. This embodiment is adapted to be attachable to a

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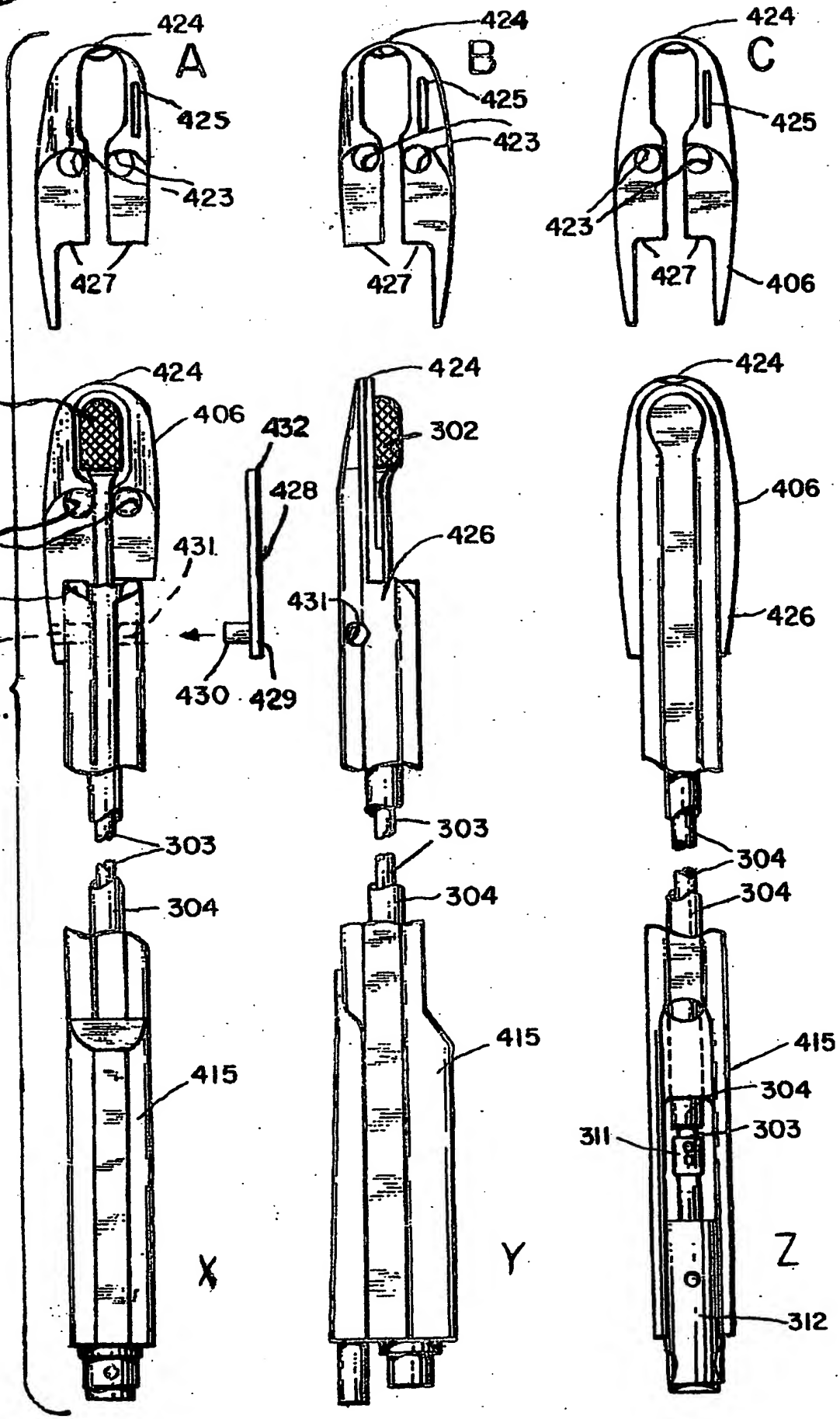

Fig12.

Figure 4 A, B, C, and D are views and a cross section of the present invention;

Figure 5 A, B, and C are views of another embodiment of the present invention;

Figure 6 B and F are views of another embodiment of the present invention. Figure 6 H is a view of the hose;

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Figure 8 is a cross sectional view of the present invention;

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Figure 10 is a front view of the bearing support;

Figure 11 is a view of another embodiment of the present invention. Figure 11 E is a view of the extended shaft;

Figure 12 X, Y, Z and A, B, C are views of another embodiment of the present invention ;

Figure 13 is a view of an attachable handle;

Figure 14 A and B are views of other embodiments of the present invention;

Figure 15 is a detailed view of Figure 14 A;

Figure 16 is a schematic of the power train;

Figure 17 is a view of the clutch arrangement; and

Figure 18 is a view of the flexible shaft sleeve.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawing, there is illustrated in Figures 1A through 1E an embodiment of an arrangement fabricated according to the teaching of the present invention and generally designated 10. Figure 1A illustrates a rotary tool support generally designated 301 mountable within a hand piece generally designated 401. The hand piece 401 is fabricated to form a guard around a selected portion of the cutting surface 302. This embodiment is adapted to be attachable to a

the need for a gasket to maintain sufficient vacuum differential to suck out dust and debris.

Figure 5 A, B and C depicts a hand piece generally designated 401 fabricated according to the teachings of this invention. The arrangement illustrated in Fig. 5 A, B and C is shaped and sized for maintenance of the incisor teeth of the horse. The exposed portion of the cutting surface 302 is minimized by fabricating the outer capped top 402 of the handpiece 401 to be close fitting and encircling a large portion of the cutting surface 302. This minimizes the opportunity for the fleshy parts of the horse's mouth to become entangled between the cutting surface 302 and the handpiece 401. The edges 414 of the hand piece 401 below the cutting surface 303 are shaped to provide a smooth slightly curved surface that slips smoothly over the teeth and allows the exposed cutting surface to be forcibly pressed against the selected area of the tooth with minimal, non-interfering contact of the hand piece 401 with the teeth.

The close fitting of the cutting surface to the handpiece 401 is achieved in the preferred embodiment by fabricating the base 415 of the handpiece 401 as illustrated in Figures 6 F and 6 B. In the preferred embodiment, the base 415 is machined of aluminum bar stock to form a rounded cap 416 on one end and access channel 417 open on the other end. Wall 407 is shaped to form an encircling guard around a portion of the cutting surface thereby exposing only a selected portion of the cutting surface near the rounded cap 416. Wall 407 extends away from the rounded cap 416 and toward the access channel 417 to form a first channel for the shaft 303 mounted within the shaft support sleeve 304 as illustrated in Fig 10. This shaft channel is bifurcated below the exposed cutting surface to communicate with a second channel 408, which is part of the vacuum path. Second wall 409 forms an orifice 410 near the cutting surface. A flange mount 418 is formed as shown in Fig. 6 B as a grooved opening wherein the flange 4,11 may be mounted.

the need for a gasket to maintain sufficient vacuum differential to suck out dust and debris.

Figure 5 A, B and C depicts a hand piece generally designated 401 fabricated according to the teachings of this invention. The arrangement illustrated in Fig. 5 A, B and C is shaped and sized for maintenance of the incisor teeth of the horse. The exposed portion of the cutting surface 302 is minimized by fabricating the outer capped top 402 of the handpiece 401 to be close fitting and encircling a large portion of the cutting surface 302. This minimizes the opportunity for the fleshy parts of the horse's mouth to become entangled between the cutting surface 302 and the handpiece 401. The edges 414 of the hand piece 401 below the cutting surface 303 are shaped to provide a smooth slightly curved surface that slips smoothly over the teeth and allows the exposed cutting surface to be forcibly pressed against the selected area of the tooth with minimal, non-interfering contact of the hand piece 401 with the teeth.

The close fitting of the cutting surface to the handpiece 401 is achieved in the preferred embodiment by fabricating the base 415 of the handpiece 401 as illustrated in Figures 6 F and 6 B. In the preferred embodiment, the base 415 is machined of aluminum bar stock to form a rounded cap 416 on one end and access channel 417 open on the other end. Wall 407 is shaped to form an encircling guard around a portion of the cutting surface thereby exposing only a selected portion of the cutting surface near the rounded cap 416. Wall 407 extends away from the rounded cap 416 and toward the access channel 417 to form a first channel for the shaft 303 mounted within the shaft support sleeve 304 as illustrated in Fig 10. This shaft channel is bifurcated below the exposed cutting surface to communicate with a second channel 408, which is part of the vacuum path. Second wall 409 forms an orifice 410 near the cutting surface. A flange mount 418 is formed as shown in Fig. 6 B as a grooved opening wherein the flange 4,11 may be mounted.

the need for a gasket to maintain sufficient vacuum differential to suck out dust and debris. (A, B and C)

Figure 5 depicts a hand piece generally designated 401 fabricated according to the teachings of this invention. The arrangement illustrated in Fig. 5 (A, B and C) is shaped and sized for maintenance of the incisor teeth of the horse. The exposed portion of the cutting surface 302 is minimized by fabricating the outer capped top 402 of the handpiece 401 to be close fitting and encircling a large portion of the cutting surface 302. This minimizes the opportunity for the fleshy parts of the horse's mouth to become entangled between the cutting surface 302 and the handpiece 401. The edges 414 of the hand piece 401 below the cutting surface 303 are shaped to provide a smooth slightly curved surface that slips smoothly over the teeth and allows the exposed cutting surface to be forcibly pressed against the selected area of the tooth with minimal, non-interfering contact of the hand piece 401 with the teeth.

The close fitting of the cutting surface to the handpiece 401 is achieved in the preferred embodiment by fabricating the base 415 of the handpiece 401 as illustrated in Figures 6 F and 6 B. In the preferred embodiment, the base 415 is machined of aluminum bar stock to form a rounded cap 416 on one end and access channel 417 open on the other end. Wall 407 is shaped to form an encircling guard around a portion of the cutting surface thereby exposing only a selected portion of the cutting surface near the rounded cap 416. Wall 407 extends away from the rounded cap 416 and toward the access channel 417 to form a first channel for the shaft 303 mounted within the shaft support sleeve 304 as illustrated in Fig 10. This shaft channel is bifurcated below the exposed cutting surface to communicate with a second channel 408, which is part of the vacuum path. Second wall 409 forms an orifice 410 near the cutting surface. A flange mount 418 is formed as shown in Fig. 6 B as a grooved opening wherein the flange 411 may be mounted.

starting at guard 407 and then into the bearing support channel 421. The bearing support sleeve 304 is then inserted into the bearing support channel 421 engaging the shaft 303 through the bearing 305 so that the shaft 303 extends beyond the end of the bearing support sleeve 304 remote from the bearing. The bearing support sleeve 304 is secured in place within the bearing support channel 421 by setscrews 405. Now referring to Figure 5 C, a connector 311 being first mounted to an adapter to a flexible shaft 312, is mounted on the extended end of the shaft 303. The adapter 312 being secured in place by a setscrew 405.

Figure 11F illustrates the base 415 of an extended arrangement sized for reaching the rear molars inside the horse's mouth and fabricated according to the teaching of the invention. In the preferred arrangement, the base 415 is 14 inches long. This additional length requires the shaft 303 attached to the cutting surface 302, the bearing support sleeve 304, flange 411, and hollow tube 420 illustrated in Fig. 11, to also be proportionally longer. These items may be extended as illustrated in Figure 11 E. A connector 311 attaches shaft extension 313 to the shaft 303 of the cone shaped cutting surface 302.

An additional setscrew 405 may be used to secure the longer bearing support sleeve 304. The orifice 410 formed by wall 409 at the front end of the vacuum channel 408 remains similar as it is sized in relationship to the cutting surface 302.

Figures 12 X, Y and Z illustrate the assembled extended arrangement having a base 415 approximately 14 inches long supporting a rotary tool having a cutting surface 302 and shaft 303 mounted within a bearing support sleeve 304. A connector 311 with adapter to flexible shaft 312 is mounted on the end of the shaft 303 remote from the cutting surface 302.

Because the back of the horse mouth is surrounded by fleshy material, the rounded cap 416 of the base 415 may provide

starting at guard 407 and then into the bearing support channel 421. The bearing support sleeve 304 is then inserted into the bearing support channel 421 engaging the shaft 303 through the bearing 305 so that the shaft 303 extends beyond the end of the bearing support sleeve 304 remote from the bearing. The bearing support sleeve 304 is secured in place within the bearing support channel 421 by setscrews 405. Now referring to Figure 5 C, a connector 311 being first mounted to an adapter to a flexible shaft 312, is mounted on the extended end of the shaft 303. The adapter 312 being secured in place by a setscrew 405.

Figure 11F illustrates the base 415 of an extended arrangement sized for reaching the rear molars inside the horse's mouth and fabricated according to the teaching of the invention. In the preferred arrangement, the base 415 is 14 inches long. This additional length requires the shaft 303 attached to the cutting surface 302, the bearing support sleeve 304, flange 411, and hollow tube 420 illustrated in Fig. 11, to also be proportionally longer. These items may be extended as illustrated in Figure 11 E. A connector 311 attaches shaft extension 313 to the shaft 303 of the cone shaped cutting surface 302.

An additional setscrew 405 may be used to secure the longer bearing support sleeve 304. The orifice 410 formed by wall 409 at the front end of the vacuum channel 408 remains similar as it is sized in relationship to the cutting surface 302.

Figures 12 [F and 12 B] X, Y and Z illustrate the assembled extended arrangement having a base 415 approximately 14 inches long supporting a rotary tool having a cutting surface 302 and shaft 303 mounted within a bearing support sleeve 304. A connector 311 with adapter to flexible shaft 312 is mounted on the end of the shaft 303 remote from the cutting surface 302.

Because the back of the horse mouth is surrounded by fleshy material, the rounded cap 416 of the base 415 may provide

starting at guard 407 and then into the bearing support channel 421. The bearing support sleeve 304 is then inserted into the bearing support channel 421 engaging the shaft 303 through the bearing 305 so that the shaft 303 extends beyond the end of the bearing support sleeve 304 remote from the bearing. The bearing support sleeve 304 is secured in place within the bearing support channel 421 by setscrews 405. Now referring to Figure 5 C, a connector 311 being first mounted to an adapter to a flexible shaft 312, is mounted on the extended end of the shaft 303. The adapter 312 being secured in place by a setscrew 405.

Figure 11F illustrates the base 415 of an extended arrangement sized for reaching the rear molars inside the horse's mouth and fabricated according to the teaching of the invention. In the preferred arrangement, the base 415 is 14 inches long. This additional length requires the shaft 303 attached to the cutting surface 302, the bearing support sleeve 304, flange 411, and hollow tube 420 illustrated in Fig. 11, to also be proportionally longer. These items may be extended as illustrated in Figure 11 E. A connector 311 attaches shaft extension 313 to the shaft 303 of the cone shaped cutting surface 302.

An additional setscrew 405 may be used to secure the longer bearing support sleeve 304. The orifice 410 formed by wall 409 at the front end of the vacuum channel 408 remains similar as it is sized in relationship to the cutting surface 302.

Figures 12~~A and 12B~~ X, Y and Z illustrate the assembled extended arrangement having a base 415 approximately 14 inches long supporting a rotary tool having a cutting surface 302 and shaft 303 mounted within a bearing support sleeve 304. A connector 311 with adapter to flexible shaft 312 is mounted on the end of the shaft 303 remote from the cutting surface 302.

Because the back of the horse mouth is surrounded by fleshy material, the rounded cap 416 of the base 415 may provide

above. Both configurations provide a direct connection between the motor 101 and the cutting surface 302 of the tool. In the preferred embodiment of the power train 201, an adjustable torque clutch 206 is included. Should the preselected torque of the clutch 206 be exceeded during use of the arrangement fabricated according to the teachings of this invention, the clutch 206 will disengage the powered motion of the motor 101 from the tool thereby minimizing possible injury to the horse or user and allow the user to safely clear any obstruction of the arrangement before continuing use.

Figure 17 illustrates a clutch 206 having a set of clutch plates 207, a torque adjustment knob 208 that sets the tension between the clutch plates 207. An end adapter 209 compatible with the flexible shaft 204 is mounted on the clutch 206 remote from the motor 101. The clutch 206 is mounted within the collet 202 of the motor 101.

A clutch housing 210 is fabricated to slip over the clutch 206 and onto the motor 101 to a position whereby the end adapter 209 is engagable by the end of the flexible shaft 204 which is mounted within the clutch housing 210. A sliding window 211 may be mounted on the clutch housing 210 to allow easy access by the user to the torque adjustment knob 208.

Figure 16 illustrates a collar 212 fabricated from stainless steel and mounted on the flexible shaft 204 remote from the end of the flexible shaft mounted to the clutch housing 210. The collar 212 is fabricated with a catch 213 engagable by the latch 413 mounted on the base 415 of the hand piece 401 when the collar 212 is inserted within access channel 417. The rotational motion of the motor 101 is selectively, interruptably transmitted to the clutch 206, through the flexible shaft 204 engagable with the flexible shaft adapter 312 to the cutting surface 302.

above. Both configurations provide a direct connection between the motor 101 and the cutting surface 302 of the tool. In the preferred embodiment of the power train 201, an adjustable torque clutch 206 is included. Should the preselected torque of the clutch 206 be exceeded during use of the arrangement fabricated according to the teachings of this invention, the clutch 206 will disengage the powered motion of the motor 101 from the tool thereby minimizing possible injury to the horse or user and allow the user to safely clear any obstruction of the arrangement before continuing use.

Figure 17 illustrates a clutch 206 having a set of clutch plates 207, a torque adjustment knob 208 that sets the tension between the clutch plates 207. An end adapter 209 compatible with the flexible shaft 204 is mounted on the clutch 206 remote from the motor 101. The clutch 206 is mounted within the collet 202 of the motor 101.

A clutch housing 210 is fabricated to slip over the clutch 206 and onto the motor 101 to a position whereby the end adapter 209 is engagable by the end of the flexible shaft 204 which is mounted within the clutch housing 210. A sliding window 211 may be mounted on the clutch housing 210 to allow easy access by the user to the torque adjustment knob 208.

Figure [18] 16 illustrates a collar 212 fabricated from stainless steel and mounted on the flexible shaft 204 remote from the end of the flexible shaft mounted to the clutch housing 210. The collar 212 is fabricated with a catch 213 engagable by the latch 413 mounted on the base 415 of the hand piece 401 when the collar 212 is inserted within access channel 417. The rotational motion of the motor 101 is selectively, interruptably transmitted to the clutch 206, through the flexible shaft 204 engagable with the flexible shaft adapter 312 to the cutting surface 302.

above. Both configurations provide a direct connection between the motor 101 and the cutting surface 302 of the tool. In the preferred embodiment of the power train 201, an adjustable torque clutch 206 is included. Should the preselected torque of the clutch 206 be exceeded during use of the arrangement fabricated according to the teachings of this invention, the clutch 206 will disengage the powered motion of the motor 101 from the tool thereby minimizing possible injury to the horse or user and allow the user to safely clear any obstruction of the arrangement before continuing use.

Figure 17 illustrates a clutch 206 having a set of clutch plates 207, a torque adjustment knob 208 that sets the tension between the clutch plates 207. An end adapter 209 compatible with the flexible shaft 204 is mounted on the clutch 206 remote from the motor 101. The clutch 206 is mounted within the collet 202 of the motor 101.

A clutch housing 210 is fabricated to slip over the clutch 206 and onto the motor 101 to a position whereby the end adapter 209 is engagable by the end of the flexible shaft 204 which is mounted within the clutch housing 210. A sliding window 211 may be mounted on the clutch housing 210 to allow easy access by the user to the torque adjustment knob 208. SHOULD BE FIG 16

Figure 18 illustrates a collar 212 fabricated from stainless steel and mounted on the flexible shaft 204 remote from the end of the flexible shaft mounted to the clutch housing 210. The collar 212 is fabricated with a catch 213 engagable by the latch 413 mounted on the base 415 of the hand piece 401 when the collar 212 is inserted within access channel 417. The rotational motion of the motor 101 is selectively, interruptably transmitted to the clutch 206, through the flexible shaft 204 engagable with the flexible shaft adapter 312 to the cutting surface 302.